

REMARKS

The Examiner objected to claims 16-17 because two claims were numbered claim 16 and two claims were numbered 17. In response, Applicant has renumbered the latter three claims as 17, 18 and 19. Applicant has also renumbered original claim 18 as claim 20. Applicant submits that these amendments overcome the informalities objection raised by the Examiner.

The Examiner rejected claims 1-18 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention. In accordance with the correction of the informalities as addressed above, Applicant has addressed this rejection as the rejection of claims 1-20. Specifically, in accordance with the Examiner's requirements, in claim 1, 14 and 20, the word "rotating" has been changed to - - pivoting- -; and in claims 10, 14, 17, & 18 (17 and 18 now being numbered as 19 & 20) the word "similar" has either been replaced with the words - - substantially identical- - or has been deleted completely. Support for this latter amendment is found in the drawings accompanying the application where it can be seen in Figs. 1, 3, 9 & 10 that the flap portions 14 and 15 are substantially identical in construction and simply fold over the mid-region of the belt in opposite directions.

The Examiner rejected claims 1-18 (now renumbered in this response as claims 1-20) as being unpatentable over either Tschantz (6,540,069) or Tschantz

(5,107,983) in view of either Gilbert (2,998,121) or Bouzat et al. (3,630,340). The Examiner stated that the belts disclosed by Tschantz (6,540,069) and Tschantz (5,107,983) meet all of the limitations of the claims but lack bottom grooves; and that Gilbert and Bouzat et al teach bottom grooves. The Examiner stated that it would have been obvious to modify either of the conveyor belts as taught by Tschantz with bottom grooves in order to increase efficiency as taught by either Gilbert or Bouzat et al.

In response, Applicant submits that while at first glance it would appear that combining the teachings of these four references would be obvious, in reality forming the grooves in the bottom surface of the belt actually went against the knowledge and practice of the industry at the time of the invention.

Conveyor belts are designed to transfer a load from a starting point to an ending point in a manufacturing or processing facility. Various factors have to be considered when designing a conveying system and some of these considerations include the type of load to be carried, the weight of the load to be carried, the distance the load has to be moved, whether or not the load has to be transported to a different height and the speed that the belt has to travel. Other factors to be considered include whether the belt needs to be oil resistant, heat resistant and/or abrasion resistant. These considerations dictate the materials that are used in the belt manufacture, the width of the belt and the strength and rigidity needed in the belt. A person of ordinary skill in the art of designing and manufacturing of conveyor belts will take all of the above factors into consideration and will produce a belt that maximizes the features desired in the belt. Different applications result in completely different belts. Belts that are designed to carry light loads at high speeds will differ greatly from belts that are designed to carry heavy loads

at high speeds. Similarly, belts that are designed to transport a load to a higher elevation will differ considerably from belts that do not transport loads to a higher elevation. A person of ordinary skill in the art will immediately recognize the necessary differences in materials and construction constraints between belts and they may consequently not find it obvious to apply features of a first type of belt used for a first application to a second belt used for a different application. Applicant respectfully submits that this is the case with respect to the suggested combining of the cited references.

Applicant will first address the combination of the two Tschantz patents ('069) and ('983) with Bouzat and will then consider the combination of the two Tschantz patents with the patent issued to Gilbert.

Applicant respectfully submits, that while on the surface it would appear that it would have been obvious to combine the teachings of Bouzat with Tschantz ('069) or Tschantz ('983), a person of ordinary skill in this art would not have been led to combine the teachings of these references because of the difference in the intended application of these belts. The type of belt taught by Bouzat is not used in the applications contemplated by the Tschantz patents and vice versa. While the two belts may initially appear to be very similar, they are in fact very different in application and therefore in construction. Bouzat discloses in column 1, lines 3-5 that his invention relates to:

“reinforced conveyor belts and applies particularly to conveyor belts which are narrow and are subjected to considerable tensile stress during use”

(Emphasis added by Applicant)

These belts are known as cable belts and are useful in applications where the loads to be transported are heavy and have to be moved over long distances. Cable belts therefore have to have very high transverse rigidity (Bouzat column 1, lines 8-9) to provide the strength needed to support the load. Furthermore, cable belts are not typically used in applications where there are changes in elevation as the belts are laterally unstable and cannot be easily controlled. The strength and rigidity in cable belts comes from the longitudinally oriented cables. Furthermore, as Bouzat discloses in column, lines 6-11:

*"Due to the size of their longitudinal reinforcement, which is generally in the form of one or two layers of longitudinal cables, **belts of the kind referred to have a very high traverse rigidity which makes it very difficult, if not impossible, to shape them into a trough or channel.** In addition, they are highly unstable on the sets of rollers which support them."*

(Emphasis added by Applicant)

Apart from the fact that these belts are narrow in width, as disclosed above, the belts are extremely difficult to bend into even a V-shape, never mind attempting to fold a flange of the belt over a load carried on the load carrying surface as is required by the Tschantz patents.

The belt of the present invention and those of Tschantz ('983) and Tschantz (069), on the other hand, are not cable belts, they are known as multifold belts. The present invention and the multifold belts covered by the two Tschantz patents are used in applications where the load has to be moved through radical changes in elevation and direction of the belt, where the loads are not particularly heavy, where the speed of belt travel is high and the belt is not under considerable tensile stress. Cable belts are high-tensioned belts and multifold belts are low-tensioned belts. Multifold belts are

wider, more easily controlled and laterally stable. Multifold belts require little lateral rigidity so that the flanges on the belt can be easily folded over the load carrying surface of the belt. Consequently, the narrow width of the Bouzat cable belt, its high transverse rigidity and lack of flexibility are in complete opposition to the multifold belts disclosed in Tschantz ('983) and Tschantz (069). Applicant respectfully submits that this opposition would be immediately apparent to a person of ordinary skill in the art. The thrust of the Bouzat patent is how to maintain the maximum possible amount of transverse rigidity and lateral stability while managing to bend the belt into a V-shape about a medial point on the belt. In order to achieve this slight bending of the cable belt, Bouzat has removed the longitudinal cables in the medial portion of the belt to allow it to bend more easily. Bouzat has recognized in column 1, lines 25-26 that:

“the complete absence of any reinforcement at this point [i.e. the medial point - clarification provided by Applicant] of the V causes the belt to wear at this location.”

Bouzat has addressed this need for reinforcement of the medial portion of the belt by providing two layers of cables lying perpendicular to the longitudinal axis of the belt and secondly by increasing the thickness of the bottom layer of the belt in the medial area (see Figs.1&2). The latter change provides additional material between the plies of the belt and the idler rollers that carry the belt. Applicant submits that this simply provides more material to wear away. Applicant further submits that if the grooves were not cut into the thicker material in the medial portion, bending the belt would be virtually impossible and would result in the belt cracking immediately in the medial area. Furthermore, Applicant submits that even with grooves cut into its lower surface, the Bouzat belt could not be folded over onto itself because of the extreme rigidity of this

type of belt. The rigidity of the belt and lack of flexibility thereof would require a much more complex roller system to effect the raising and lowering of any flanges and would likely lead to premature failure of any hinge areas because of the degree to which the belt would have to be manipulated. Applicant respectfully submits that one of ordinary skill in the art would recognize the differences between the Bouzat cable belt and Tschantz multifold belts that would be necessitated by their intended different applications and they would therefore not have been motivated to combine the teachings of these references. Inasmuch as they would not have been motivated to combine the teachings of these references, Applicant submits that a person of ordinary skill in the art would have not found the teachings of the Bouzat cable belt patents to be pertinent with respect to multifold belts. Applicant further submits that the two Tschantz patents, either singly or in combination with each other, do not teach grooving of a multifold belt in its bottom surface to create hinge areas. Applicant consequently submits that the present invention would not have been obvious to one of ordinary skill in the art at the time of the present invention.

Furthermore, at the time of the present invention, **Applicant's proposal to groove the bottom surface of the belt was even opposed within the company he is employed with, that company being the Assignee of the present invention.** In support of this statement, Applicant attaches hereto the Declaration of William H. Tschantz, said William Tschantz being the Patentee of cited U.S. Patent No. 5,107,983. The Applicant further attaches hereto the Declaration of the instant inventor, Richard W. Tschantz, who is also the Patentee of cited U.S. Patent No. 6,540,069. As attested to in the Declaration of William H. Tschantz, William Tschantz opposed the grooving of

the bottom surface of the belt. This opposition was based on his previous development experience obtained while working in collaboration with The Goodyear Tire and Rubber Company of Akron, Ohio. At the time of their collaboration, i.e., 1991, the rubber used in the lowermost surface of the belt was softer and less durable than the rubber used in the load-carrying surface. Both William Tschantz and the engineers at Goodyear believed that the lowermost surface of the belt was too delicate to alter. Consequently, when the present inventor proposed grooving the lower surface to address problems that were being encountered in the sugar industry, William Tschantz advised him that both he and Goodyear's engineers had determined that the only way a hinge area could successfully be made was to groove the upper surface of the belt. This was believed to be true because grooving the lower surface of the belt would not have addressed the problems caused by excess compression of the rubber in the fold area of the upper surface. William Tschantz therefore advised the present inventor that grooving the bottom surface could not work and would lead to premature failure of the hinge areas of the belt. As pointed out in both Declarations, William Tschantz and the engineers at Goodyear were extremely surprised to find that the fold area in a bottom-surface grooved belt did not rapidly crack and deteriorate. This result was contrary to all of his expectations. Furthermore, after conducting test on the bottom grooved belts, William Tschantz was even more surprised to find that the hinge area of a bottom surface grooved belt does not decay as rapidly as does the hinge area of an upper surface grooved belt. He was also surprised to discover that bottom surface grooved belts last at least as long as upper surface grooved belts. Applicant further advises that the first bottom-surface grooved multifold belt was put into commercial operation in April 2003

and to date this belt is not showing signs of fatigue and decay at the hinge areas. This lack of fatigue and breakdown of the hinge areas in this belt was completely unexpected.

Applicant respectfully submits that William Tschantz and Richard Tschantz are persons of ordinary skill in the art and that the combination of these teachings was not obvious to them at the time of the present invention. Applicant further submits that the grooving of the bottom surface of the belt went contrary to the common knowledge of persons skilled in the art at the time of the invention. Applicant further submits that the grooving of the bottom surface of the belt produced results that were unexpected by persons of ordinary skill in the art. Applicant therefore respectfully submits that the combination of the teachings of Bouzat and Tschantz ('069) and Tschantz ('983) was not obvious at the time of the present invention.

The Examiner has stated that Tschantz ('069) and Tschantz ('983) disclose all of the limitations of the present invention except the two references do not show bottom grooves. Applicant further submits that, in light of the knowledge existing in the industry at the time of the invention, a person of ordinary skill in the art considering the Tschantz ('069) and Tschantz ('983) patents either singly or in combination, would not have been led to simply groove the bottom surface of a multifold belt because at that time it was believed this bottom surface was too delicate to work with.

In order to more clearly distinguish between the multifold belt contemplated by the instant invention and the cable belts as disclosed by Bouzat, Applicant has amended claim 1 to include the term "multifold" in the preamble.
Applicant has added this term to more clearly distinguish between high-tensioned cable

belts and low-tensioned multifold belts. Applicant further submits that the previously submitted limitation of the claim which requires that the **grooved areas provide a pair of hinged areas for pivoting the outer portions of the belt inwardly upon itself to enclose a load on the medial portion of the first surface when rotated to a belt-closed position** also clearly distinguishes between a cable belt and a multifold belt inasmuch as cable belts cannot be folded over in the manner required by the claim. Applicant further submits that claim 1 distinguishes over the previously known multifold belts in that it includes the limitation that the belt be grooved in its lower second surface and as argued above, this would not have been obvious to a person of ordinary skill in the art at the time the invention was made. **Applicant respectfully submits that claims 1-20 (previously 1-18) are not obvious with respect to Tschantz ('069) and Tschantz ('983) in view of Bouzat. Applicant consequently requests the withdrawal of the rejection of claims 1-20 (previously 1-18) under 35 U.S.C. 103(a) on these grounds.**

With respect to the rejection of claims 1-20 (previously 1-18) under 35 U.S.C. 103(a) over either Tschantz ('069) or Tschantz ('983) in view of Gilbert, Applicant respectfully disagrees with the Examiner's position that Gilbert grooves the lower surface of his belt. Applicant submits that Gilbert teaches the provision of several layers that extend from one side of the belt to the other and separate areas of reinforcing for the side walls and the load carrying surface. There is no cutting into any of the layers of the belt. It has been found in the industry that if a rubber conveyor belt is bent at all, the rubber in the upper surface of the belt is placed under compression

and cracks tend to develop in the lower surface opposite the area under compression. The cracks lead to the exposure of the plies in the belt and this leads to premature degradation and failure of the belt. However, one of the problems belt designers and manufactures have faced is that certain loads simply cannot be carried on a flat conveyor belt, they need to be contained as they travel on the upper surface of the belt. This need was identified by Gilbert (column 1, lines 17-31) where he indicated that juice from transported fruits and vegetables dripped off conveyor belts and seeped under the side walls of the system, presenting a sanitation hazard. His belt was designed to address this issue. In essence, he provided side walls on his belt to contain juices from the fruits and vegetables. As Gilbert disclosed in column 2, lines 64-71, it is difficult to keep a thin rubber wall standing in an upright position. The marginal portions (upright side walls) of his belt were therefore provided with reinforcing namely *“one or more plies 59 which are separate and apart from and independent of the symmetrically included plies 57 backing up the load carrying surface”*. Gilbert added reinforcing to his marginal portions (i.e. side walls) of the belt to help them stand upright at substantially right angles to the load carrying surface (column 2, lines 64-71). By providing reinforcing layers, he was attempting to prevent the marginal portions (side walls) from doubling up, i.e. folding over the load carrying surface of the belt. Applicant therefore respectfully submits that Gilbert therefore teaches directly away from Tschantz ('069), Tschantz ('983) and the instant invention in that his belt prevents the exact thing that the instant invention is attempting to achieve, namely, the covering of the load carried on the load carrying surface. Gilbert's patent further discloses and claims (claim 1, column 4, lines 23-27) that the stresses of raising and lowering the side walls relative to the load

carrying surface are absorbed by transversely running artificial fibers across the hinge lines of the flanges. Gilbert therefore does not teach grooving the bottom surface of his belt to enable the belt to be bent even slightly or completely over onto itself as he does not disclose the cutting of any grooves into any layers that extend across the belt. He simply reinforces the bottom and sides of the belt separately. Applicant submits that folding the sides of Gilbert's belt over onto the load carrying surface would result in cracking of the rubber at the hinge areas because the material on the upper surface of the belt is in compression. Gilbert has partially addressed this issue by providing fibers that strengthen the hinge areas when they are bent. There is no disclosure in this reference of cutting grooves into bottom layer of Gilbert's belt. Applicant submits that this suggestion has come entirely from the instant application. Applicant therefore respectfully submits that combining Gilbert with either Tschantz (6,540,069) or Tschantz (5,107,983) would not result in a conveyor belt having bottom grooves, it would result in a conveyor belt having fiber-reinforced hinge areas with grooves cut in the upper surface of the belt. **Applicant therefore respectfully submits that the present invention is not obvious under 35 U.S.C. Section 103(a) in light of the combination of Gilbert and Tschantz (6,540,069) or Tschantz (5,107,983). Applicant respectfully requests the withdrawal of the rejection of claims 1-20 (previously 1-18) on these grounds.**

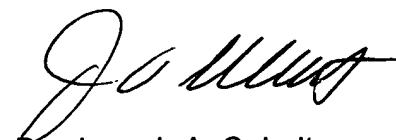
Applicant further states that the Assignee has had considerable commercial success with the conveyor belt of the present invention and that furthermore, from initial testing and use of the bottom grooved belt, it has been found that the belts have an unexpectedly long life in comparison to previously known belts which have been

grooved in the load carrying surface. Applicant submits that this commercial success and the unexpected long life of the bottom grooved belts further adds support to the Applicant's position that this belt was not obvious at the time of the present invention.

Applicant submits that claims 1-20 (previously numbered as claims 1-18) are in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted at Canton, Ohio this 6TH day of APRIL, 2005.

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Enclosures - Declaration of William Tschantz
Declaration of Richard Tschantz